



PATENT  
ATTORNEY'S DOCKET NO.: HIR-139

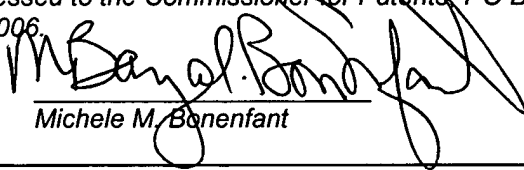
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPELLANT: Masato Katayama et al.  
SERIAL NO.: 09/931,193  
FILED: August 15, 2001  
FOR: ROOTS INDUCING AGENT OF PLANTS AND  
ITS TREATMENT METHOD  
EXAMINER: A. Pryor  
ART UNIT: 1616

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CERTIFICATE OF MAILING

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Michele M. Bonenfant

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PO Box 1450  
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**A P P E A L B R I E F**

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## TABLE OF CONTENTS

	<u>Page</u>
REAL PARTY IN INTEREST .....	1
RELATED APPEALS AND INTERFERENCES .....	1
STATUS OF CLAIMS .....	1
STATUS OF AMENDMENTS .....	1
SUMMARY OF CLAIMED SUBJECT MATTER.....	1
GROUND OF REJECTION TO BE REVIEWED ON APPEAL.....	3
ARGUMENT .....	4
1.The Rejection of Claims 5, 6, 9, 11, 15-18 and 23 as Obvious in View of Ahmad et al. ) is Improper Because Each of Those Claims Includes Limitations Not Disclosed or Suggested in Ahmad et al.....	4
2. The Rejection of Claims 5, 6, 9, 11, 15-18, 20 and 23 as Defining Subject Matter that would have been an Obvious in View of Katayama (Bioscience, Biotechnology, and Biochemistry, Department, 2000, 64(4) 808-815) is Improper Where the Claimed Composition is Different from the Asserted Prior Art.....	7
3. Each of Claims 6, 16 and 18 Includes Additional Limitations That Are Not Disclosed or Suggested by the Cited References and Provide Additional Basis for a Conclusion That Those Claims are Not Obvious in View of the Cited References.....	10
CONCLUSION .....	10
APPENDIX A - LISTING OF CLAIMS.....	A1
APPENDIX B – AMENDMENT.....	B1
APPENDIX C – RULE 1.132 DECLARATION OF MASATO KATAYAMA.....	C1

### **REAL PARTY IN INTEREST**

The real parties in interest are Masato Katayama and Eiji Kageyama, the inventors of the invention disclosed and claimed in the patent application subject of this appeal.

### **RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences.

### **STATUS OF CLAIMS**

Claims 5-11, 13, 15-18 and 20-24 are pending in the application. In the action mailed May 20, 2005, claims 5, 6, 9, 11, 15-18, 20 and 23 stand twice rejected and form the basis for this appeal. Claims 7, 8, 10, 13, 21, 22 and 24 are objected-to.

### **STATUS OF AMENDMENTS**

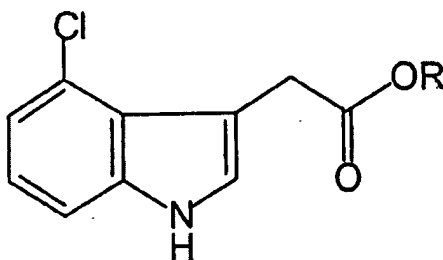
After-final amendments have been made to claims 7,8,10,13,21,22 and 24 that stand objected-to. The amendments rewrite the objected-to claims in independent form. An Amendment is submitted herewith in Appendix B. Consideration and entry of the after-final amendments pursuant to 37 C.F.R. § 41.33(b)(2) are respectfully requested.

### **SUMMARY OF CLAIMED SUBJECT MATTER**

Applicants' invention is directed to a root-inducing system that provides a streamlined means to effectuate root growth on plants or plant cuttings lacking any root system. The invention improves upon prior art approaches that required several laborious, time-consuming steps such as soaking or powdering a root-growth inducing agent directly onto the cut surfaces of plant stems or leaves prior

to implantation into growth-supporting soil. Instead, Applicants' novel solution is applied to the leaves of cuttings.

Applicants' novel root-inducing solution includes water and a root-inducing compound of the following formula I:



with R selected from the group consisting of Hydrogen, allyl, methyl ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl.

Independent claim 5 covers a rootless cutting with at least one leaf and a solution comprised of water and compound of formula I that is of sufficient concentration to induce root generation from the rootless cutting when the solution is sprayed onto the at least one leaf. (Spec. p.2).

Claim 6 depends from claim 5 and covers a compound of formula I having a concentration of  $10^{-7}$  to  $10^{-2}$ M. (Spec. p.3, 4)

Claim 9 depends from claim 5 and adds the limitation of an organic solvent. (Spec. p. 5).

Claim 11 depends from claim 5 and adds the limitation of a beneficial agricultural chemical selected from the group consisting of fertilizers, spreading agents and plant growth regulators. (Spec. p.5)

Claim 15 depends from claim 5 and adds the limitation of an automated sprinkling system to which the sprayer is permanently attached. (Spec. p.9).

Independent claim 16 covers a rootless cutting combination with at least one leaf and a solution selected from group consisting of water, alcohols and organics combined with a compound of formula I having a concentration of  $10^{-7}$  to  $10^{-2}$ M to induce root generation from the rootless cutting when the combined solution and formula I are applied to the surface of the at least one leaf. (Spec. p.5).

Independent claim 17 covers a method of promoting root formation on plant cuttings including providing a solvent, providing a root inducing compound, mixing the solvent and compound and applying the mixture to a plant leaf of a plant cutting to induce root formation. (Spec. p. 4-7)

Claim 18 depends from claim 17 and includes the added step of providing a root inducing compound of formula I having a concentration of  $10^{-7}$  to  $10^{-2}$ M. (Spec. p. 3).

Claim 20 depends from claim 17 and includes the step of adding beneficial agricultural chemical selected from the group consisting of fertilizers, spreading agents and plant growth regulators. (Spec. p.5)

Claim 23 depends from claim 17 and includes the step of placing the liquid mixture in a sprayer. (Spec. p. 9)

### **GROUNDINGS OF REJECTION TO BE REVIEWED ON APPEAL**

1. Whether claims 5, 6, 9, 11-18 and 23 define subject matter, as a whole, that would have been obvious to one of ordinary skill in the art in view of Ahmad et al. (Physiologia Plantarum, 1987, 69(1), 137-140).

2. Whether claims 5, 6, 9, 15-18 and 23 define subject matter, as a whole, that would have been obvious to one of ordinary skill in the art in view of Katayama (Bioscience, Biotechnology, Biochemistry, Department 64(4) 808-815).

### **ARGUMENT**

**1. The Rejection of Claims 5, 6, 9, 11, 15-18 and 23 as Obvious in View of Ahmad et al. ) is Improper Because Each of Those Claims Includes Limitations Not Disclosed or Suggested in Ahmad et al.**

Claims 5, 6, 9, 11, 15-18 and 23 stand twice rejected under 35 U.S.C. §103 as being obvious in view of Ahmad et al. (Non-final Action at p. 2). The May 20, 2005 Office Action concedes that Ahmed et al. does not recite the claimed concentrations of 4-chloroindole-3-acetic acid ("4-CL-IAA") or the application of the inventive compounds onto plant cuttings via spraying on leaves of the cuttings. These specific elements recited in the rejected claims are deemed to be "inherent" or contained in the prior art. Yet, not a single reference is cited in support of these positions. This is not surprising as nothing in the prior art, to applicants' knowledge, discloses Applicants' claimed concentration ranges. With respect to the spraying limitation, everything in the prior art,

to applicants' knowledge, involves spraying plants having *existing* root structures with beneficial compounds, such as fertilizers, to expedite transport of the compounds to the existing roots.<sup>1</sup> In addition to these voids, there is absent from the office action argument any recitation of highly relevant negative disclosure in the Ahmed et al. reference.

When considering whether evidence exists in a cited reference, there is no rule known to Applicants that requires the overall teachings of a reference to be discounted due to the absence of a particular element in the claims under consideration. To the contrary, a prior art reference must be considered for all it teaches and discloses including disclosure that teaches away from the invention. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1885), *cert. denied*, 475 U.S. 1017 (1986). To do otherwise would allow references to be considered piece meal, and an applicant's disclosure to be considered as a blue print, the "essence of hindsight. *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999).

Ahmed et al. clearly discloses dipping cuttings in either a powder or solution containing root-promoting agents. This is consistent with what was known in the prior art at the time the application was filed.<sup>2</sup> This also is exactly what applicants' invention is designed to avoid—the laborious and inefficient prior art process of soaking cuttings in root-growth promoting solutions. This aspect of the Ahmed et al. disclosure clearly

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<sup>1</sup> See Rule 1.132 Declaration of Masato Katayama at ¶ 4; APPENDIX C. Applicants request entry and consideration of the 1.132 affidavit. The affidavit was not earlier filed as it was not deemed necessary to overcome the prior art of record based on the amendments included in the reply to the Office Action mailed October 6, 2004. Ahmed et al. was not previously cited as the basis of an obviousness rejection.

teaches away from applicants' claimed invention and should result in the Ahmed et al. reference being deemed an improper reference upon which to base an obviousness rejection. One of ordinary skill in the art would not be motivated to apply 4-CL-IAA by spraying on the leaves of a plant cutting without first reading applicants' patent specification and claims. Again, this represents a case of classic hindsight reasoning. On this basis alone, the rejections should be removed.

Applicants' claimed invention is also unobvious due to the transition of the composition of formula 1 within the plant, which allows the roots-inducing agent to travel from the leaves to the incision of the plant cutting.<sup>3</sup> Ahmed et al. is silent on this feature. This aspect of the claimed invention also provides an additional benefit not found in the prior art procedure of soaking.

Soaking multiple plants in a roots-inducing agent facilitates the possibility of the transmission of viruses from one infected cutting to another via the shared agent fluid.<sup>4</sup> With applicants' claimed method, cuttings are isolated by being inserted into soil (cultivation) before spraying with the roots-inducing agent. This effectively reduces or eliminates the possibility of viral transmission. Applicants' claimed spraying method also allows for reapplication of the roots-inducing agent—something that is not possible with the prior art soaking method.<sup>5</sup>

The horticultural industry mass produces plants grown for sale by asexual means, specifically by propagation from a parent by a rootless cutting.<sup>6</sup> Such mass

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<sup>2</sup> Id. at ¶ 2.

<sup>3</sup> Id. at ¶ 4.

<sup>4</sup> Id. at ¶ 5.

<sup>5</sup> Id.

<sup>6</sup> Id. at ¶ 6.



production requires efficient methods to enhance root and plant growth. Applicants' claimed invention fills this long-felt need in the plant producing industry that has not previously been addressed successfully in the prior art.<sup>7</sup>

For all these reasons, claims 5, 6, 9, 11, 15-18, 20 and 23 are unobvious over Ahmed et al. and should be allowed.

**2. The Rejection of Claims 5, 6, 9, 11, 15-18, 20 and 23 as Defining Subject Matter that would have been an Obvious in View of Katayama (Bioscience, Biotechnology, and Biochemistry, Department, 2000, 64(4) 808-815) is Improper Where the Claimed Composition is Different from the Asserted Prior Art.**

Applicants' arguments with respect to the rejection of claims 5, 6, 9, 11, 15-18, 20 and 23 as being obvious in view of Katayama are the same as those given in reply to the rejections based on Ahmed et al. To a large extent, the arguments are reproduced here for ease of reference.

The May 20, 2005 Office Action concedes that Katayama does not recite the claimed concentrations of 4-chloroindole-3-acetic acid ("4-CL-IAA") or the application of the inventive compounds onto plant cuttings via spraying on leaves of the cuttings. These specific elements recited in the rejected claims are deemed to be "inherent" or contained in the prior art. Yet, not a single reference is cited in support of these positions. This is not surprising as nothing in the prior art, to applicants' knowledge, discloses Applicants' claimed concentration ranges. With respect to the spraying limitation, everything in the prior art, to applicants' knowledge, involves spraying plants having *existing* root structures with beneficial compounds, such as fertilizers, to

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<sup>7</sup> Id.

expedite transport of the compounds to the existing roots.<sup>8</sup> In addition to these voids, there is absent from the office action argument any recitation of highly relevant negative disclosure in the Katayama reference.

When considering whether evidence exists in a cited reference, there is no rule known to Applicants that requires the overall teachings of a reference to be discounted due to the absence of a particular element in the claims under consideration. To the contrary, a prior art reference must be considered for all it teaches and discloses including disclosure that teaches away from the invention. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1885), *cert. denied*, 475 U.S. 1017 (1986). To do otherwise would allow references to be considered piece meal, and an applicant's disclosure to be considered as a blue print, the "essence of hindsight. *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999).

Katayama clearly discloses *soaking* cuttings in the disclosed test compounds (as well as soaking cuttings in the control group solutions). This is consistent with what was known in the prior art at the time the application was filed.<sup>9</sup> This also is exactly what applicants' invention is designed to avoid—the laborious and inefficient prior art process of soaking cuttings in root-growth promoting solutions. This aspect of the Katayama disclosure clearly teaches away from applicants' claimed invention and should result in the Katayama reference being deemed an improper reference upon which to base an obviousness rejection. One of ordinary skill in the art would not be motivated to apply 4-CL-IAA by spraying on the leaves of a plant cutting without first reading applicants'

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<sup>8</sup> Id. at ¶ 4.

patent specification and claims. Again, this represents a case of classic hindsight reasoning. On this basis alone, the rejections should be removed.

Applicants' claimed invention is also unobvious due to the transition of the composition of formula 1 within the plant, which allows the roots-inducing agent to travel from the leaves to the incision of the plant cutting.<sup>10</sup> Katayama is silent on this feature. This aspect of the claimed invention also provides an additional benefit not found in the prior art procedure of soaking.

Soaking multiple plants in a roots-inducing agent facilitates the possibility of the transmission of viruses from one infected cutting to another via the shared agent fluid.<sup>11</sup> With applicants' claimed method, cuttings are isolated by being inserted into soil (cultivation) before spraying with the roots-inducing agent. This effectively reduces or eliminates the possibility of viral transmission. Applicants' claimed spraying method also allows for reapplication of the roots-inducing agent—something that is not possible with the prior art soaking method.<sup>12</sup>

The horticultural industry mass produces plants grown for sale by asexual means, specifically by propagation from a parent by a rootless cutting.<sup>13</sup> Such mass production requires efficient methods to enhance root and plant growth. Applicants' claimed invention fills this long-felt need in the plant producing industry not previously addressed successfully in the prior art.<sup>14</sup>

For all these reasons, claims 5, 6, 9, 11, 15-18, 20 and 23 are unobvious over

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<sup>9</sup> Id. at ¶ 3.

<sup>10</sup> Id. at ¶ 4.

<sup>11</sup> Id. at ¶ 5.

<sup>12</sup> Id.

<sup>13</sup> Id. at ¶ 6.

Katayama and should be allowed.

**3. Each of Claims 6, 16 and 18 Includes Additional Limitations That Are Not Disclosed or Suggested by the Cited References and Provide Additional Basis for a Conclusion That Those Claims are Not Obvious in View of the Cited References**

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Each of claims 6 and 16 includes the limitation of a concentration of  $10^{-7}$  to  $10^{-2}$ M. Neither Ahmed et al. nor Katayama show or suggest such a concentration range for compound of formula as discussed in appellants' written description on page 4.

Claim 18 defines a method for inducing root growth of plant cuttings with a compound of formula I having a concentration of  $10^{-7}$  to  $10^{-2}$ M and defines patentably over the prior art for the same reasons.

**CONCLUSION**

For the foregoing reasons, the rejection of claims 5, 6, 9, 11, 15-18, 20 and 23 is improper and should be reversed.

Respectfully submitted,



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Docket No.: HIR-139

Date: January 20, 2006

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<sup>14</sup> Id.

# APPENDIX “A”

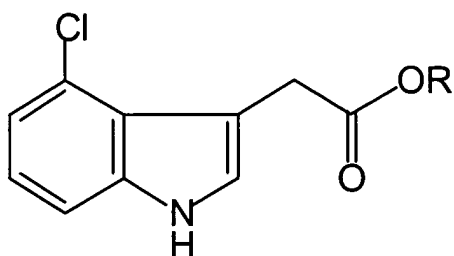


Listing of Claims:

Claims 1-4 (Canceled)

Claim 5. (Previously presented) A root-inducing system comprising:

a solution comprising water and a root inducing compound of formula I



wherein R is selected from the group consisting of hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl;

a rootless cutting having at least one leaf;

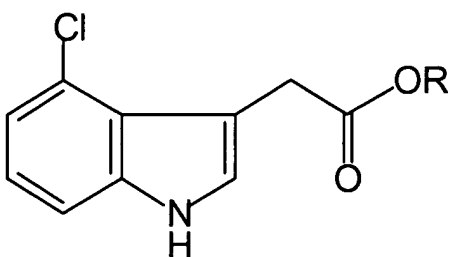
wherein the root inducing compound of formula I is in a concentration sufficient to induce the generation of roots from the rootless cutting when the solution is applied to the at least one leaf of the rootless cutting;

a sprayer to apply the solution to the rootless cutting.

Claim 6. (Previously presented) The root-inducing system of claim 5 wherein the compound has a concentration of  $10^{-7}$  to  $10^{-2}$  M.

Claim 7. (Currently amended) A root-inducing system comprising:

a solution comprising water and a root inducing compound of formula I



wherein R is selected from the group consisting of hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl;

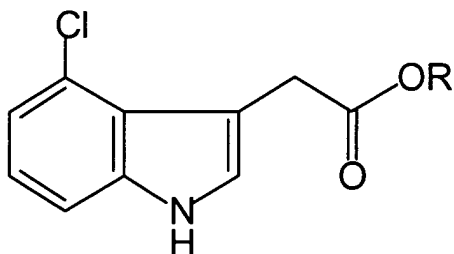
a rootless cutting having at least one leaf;

an alcohol;

wherein the root inducing compound of formula I is in a concentration sufficient to induce the generation of roots from the rootless cutting when the solution is applied to the at least one leaf of the rootless cutting;  
a sprayer to apply the solution to the rootless cutting.

Claim 8. (Currently amended) A root-inducing system comprising:

a solution comprising water and a root inducing compound of formula I



wherein R is selected from the group consisting of hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl;

a rootless cutting having at least one leaf;

a polyoxyethylenealkyl phenyl ether;

wherein the root inducing compound of formula I is in a concentration sufficient to induce the generation of roots from the rootless cutting when the solution is applied to the at least one leaf of the rootless cutting;  
a sprayer to apply the solution to the rootless cutting.

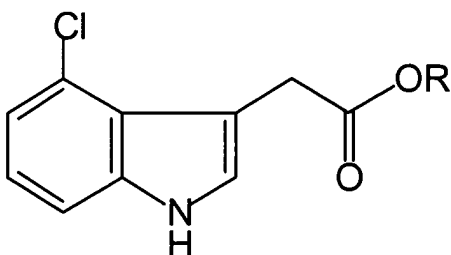
Claim 9. (Previously presented) The root-inducing system of claim 5 further comprising:



an organic solvent.

Claim 10. (Currently amended) A root-inducing system comprising:

a solution comprising water and a root inducing compound of formula I



wherein R is selected from the group consisting of hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl;

a rootless cutting having at least one leaf;

xylene as an organic root solvent;

wherein the root inducing compound of formula I is in a concentration sufficient to induce the generation of roots from the rootless cutting when the solution is applied to the at least one leaf of the rootless cutting;  
a sprayer to apply the solution to the rootless cutting.

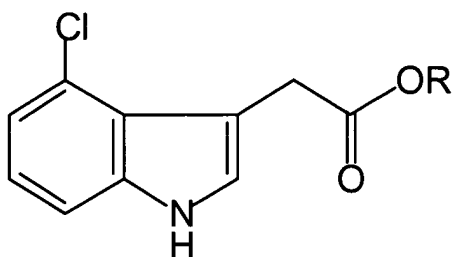
Claim 11. (Previously presented) The root-inducing system of claim 5 further comprising:

a beneficial agricultural chemical, wherein the beneficial agricultural chemical is selected from the group consisting of fertilizers, spreading agents and plant growth regulators.

Claim 12. (Canceled)

Claim 13. (Previously presented) A root-inducing system comprising:

a solution comprising water and a root inducing compound of formula I



wherein R is selected from the group consisting of hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl;

a rootless cutting having at least one leaf;

a nonyl phenyl ether;

wherein the root inducing compound of formula I is in  
a concentration sufficient to induce the generation of  
roots from the rootless cutting when the solution is  
applied to the at least one leaf of the rootless cutting;  
a sprayer to apply the solution to the rootless cutting.

Claim 14. (Canceled)

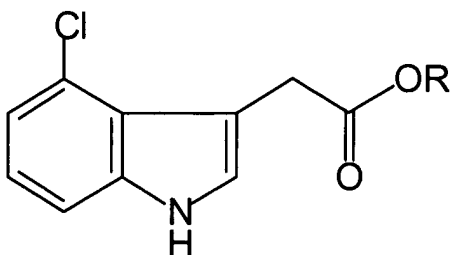
Claim 15. (Previously presented) The root-inducing system  
of claim 5 further comprising:

an automated sprinkling system wherein said sprayer is  
permanently affixed to said automated sprinkling system.

Claim 16. (Previously presented) A root-inducing  
combination comprising:

a solution selected from the group consisting of  
water, alcohols and organics;

a root inducing compound of formula I



wherein R is selected from the group consisting of hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl;

wherein the solution is mixed with the compound until a liquid having a concentration of  $10^{-7}$  to  $10^{-2}$  M of the compound is formed; and,

a rootless cutting having at least one leaf with a surface, wherein the liquid is applied to the surface of the at least one leaf to induce root formation in the rootless cutting.

Claim 17. (Currently amended) A method ~~to~~ for promoting root formation on cuttings from plants comprising:

providing a solvent;

providing a root inducing compound, wherein the root inducing compound is capable of generating root formation in a rootless cutting,

mixing the a root inducing compound with the solvent to form a liquid;

applying the liquid to a plant leaf of the rootless cutting to induce root formation.

# APPENDIX “B”

Appl. No. 09/931,193  
Amendment Dated January 20, 2006  
Reply to Office Action of May 20, 2005

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Conformation No. 1385

Appl. No. : 09/931,193  
Applicants : Masato Katayama  
Filed : 15 AUG 2001  
TC/A.U. : 1616  
Examiner : PRYOR, ALTON NATHANIEL  
  
Docket No. : HIR-139

Mail Stop RCE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**AMENDMENT**

Dear Sir or Madam:

In response to the Office Action of May 20, 2005,  
please amend the application as follows.

**Amendments to the Claims** begin on page 2 of this paper.

**Remarks/Arguments** begin on page 9 of this paper.

**Amendments to the Claims:**

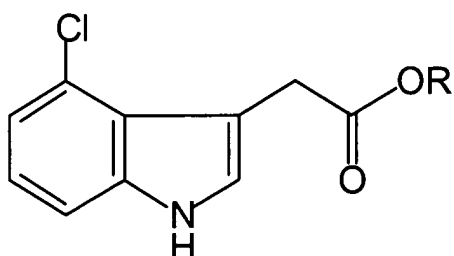
This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

Claims 1-4 (Canceled)

Claim 5. (Previously presented) A root-inducing system comprising:

a solution comprising water and a root inducing compound of formula I



wherein R is selected from the group consisting of hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl;

a rootless cutting having at least one leaf;

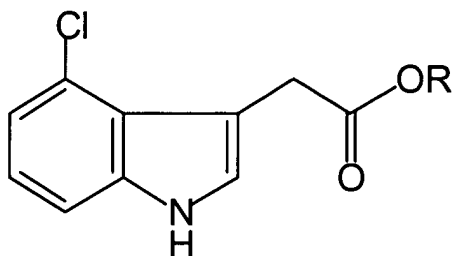
wherein the root inducing compound of formula I is in a concentration sufficient to induce the generation of

roots from the rootless cutting when the solution is applied to the at least one leaf of the rootless cutting;  
a sprayer to apply the solution to the rootless cutting.

Claim 6. (Previously presented) The root-inducing system of claim 5 wherein the compound has a concentration of  $10^{-7}$  to  $10^{-2}$  M.

Claim 7. (Currently amended) A root-inducing system comprising:

a solution comprising water and a root inducing compound of formula I



wherein R is selected from the group consisting of hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl;

a rootless cutting having at least one leaf;

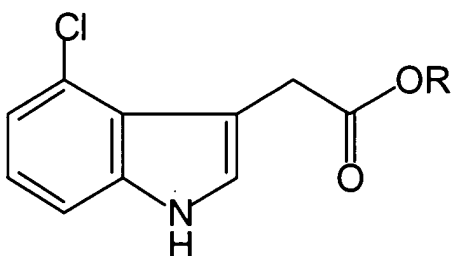


an alcohol;

wherein the root inducing compound of formula I is in  
a concentration sufficient to induce the generation of  
roots from the rootless cutting when the solution is  
applied to the at least one leaf of the rootless cutting;  
a sprayer to apply the solution to the rootless cutting.

Claim 8. (Currently amended) A root-inducing system  
comprising:

a solution comprising water and a root inducing  
compound of formula I



wherein R is selected from the group consisting of  
hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-  
butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-  
pentyl;

a rootless cutting having at least one leaf;  
a polyoxyethylenealkyl phenyl ether;

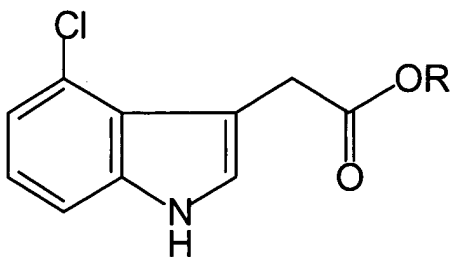
wherein the root inducing compound of formula I is in a concentration sufficient to induce the generation of roots from the rootless cutting when the solution is applied to the at least one leaf of the rootless cutting; a sprayer to apply the solution to the rootless cutting.

Claim 9. (Previously presented) The root-inducing system of claim 5 further comprising:

an organic solvent.

Claim 10. (Currently amended) A root-inducing system comprising:

a solution comprising water and a root inducing compound of formula I



wherein R is selected from the group consisting of hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl;

a rootless cutting having at least one leaf;  
xylene as an organic root solvent;  
wherein the root inducing compound of formula I is in  
a concentration sufficient to induce the generation of  
roots from the rootless cutting when the solution is  
applied to the at least one leaf of the rootless cutting;  
a sprayer to apply the solution to the rootless cutting.

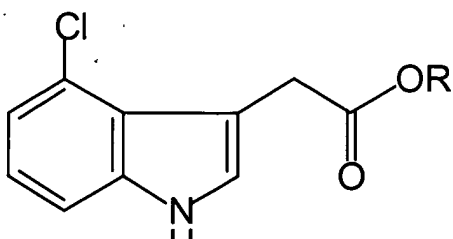
Claim 11. (Previously presented) The root-inducing system of claim 5 further comprising:

a beneficial agricultural chemical, wherein the beneficial agricultural chemical is selected from the group consisting of fertilizers, spreading agents and plant growth regulators.

Claim 12. (Canceled)

Claim 13. (Previously presented) A root-inducing system comprising:

a solution comprising water and a root inducing  
compound of formula I



wherein R is selected from the group consisting of  
hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-  
butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-  
pentyl;

a rootless cutting having at least one leaf;

a nonyl phenyl ether;

wherein the root inducing compound of formula I is in  
a concentration sufficient to induce the generation of  
roots from the rootless cutting when the solution is  
applied to the at least one leaf of the rootless cutting;  
a sprayer to apply the solution to the rootless cutting.

Claim 14. (Canceled)

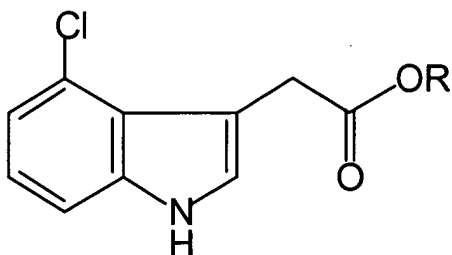
Claim 15. (Previously presented) The root-inducing system  
of claim 5 further comprising:

an automated sprinkling system wherein said sprayer is  
permanently affixed to said automated sprinkling system.

Claim 16. (Previously presented) A root-inducing combination comprising:

a solution selected from the group consisting of water, alcohols and organics;

a root inducing compound of formula I



wherein R is selected from the group consisting of hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl;

wherein the solution is mixed with the compound until a liquid having a concentration of  $10^{-7}$  to  $10^{-2}$  M of the compound is formed; and,

a rootless cutting having at least one leaf with a surface, wherein the liquid is applied to the surface of the at least one leaf to induce root formation in the rootless cutting.

Claim 17. (Currently amended) A method ~~to~~ for promoting root formation on cuttings from plants comprising:

providing a solvent;

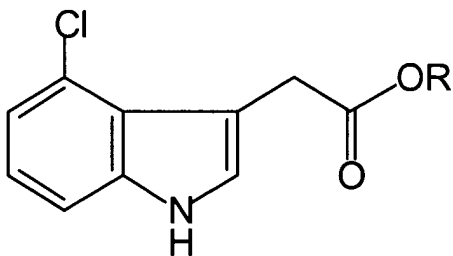
providing a root inducing compound, wherein the root inducing compound is capable of generating root formation in a rootless cutting,

mixing the a root inducing compound with the solvent to form a liquid;

applying the liquid to a plant leaf of the rootless cutting to induce root formation.

Claim 18. (Previously presented) The method of claim 17 further comprising:

providing a root inducing compound of formula I



wherein R is selected from the group consisting of hydrogen, allyl, methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, isobutyl, (R)2-butyl, (S)2-butyl, tert-butyl and 1-pentyl;

forming a concentration of  $10^{-7}$  to  $10^{-2}$  M of the root inducing compound of formula I.

Claim 19. (Canceled)

Claim 20. (Previously presented) The method of claim 17 further comprising:

adding beneficial agricultural chemical, wherein the beneficial agricultural chemical is selected from the group consisting of fertilizers, spreading agents and plant growth regulators.

Claim 21. (Currently amended) A method for promoting root formation on cuttings from plants comprising:

providing a solvent;

providing a root inducing compound, wherein the root inducing compound is capable of generating root formation in a rootless cutting,

adding sodium dodecylbenzenesulfonate;

mixing the root inducing compound with the solvent to form a liquid;

applying the liquid to a plant leaf of the rootless cutting to induce root formation.

Claim 22. (Currently amended) A method for promoting root formation on cuttings from plants comprising:

providing a solvent;

providing a root inducing compound, wherein the root inducing compound is capable of generating root formation in a rootless cutting,

adding nonyl phenyl ether;

mixing the root inducing compound with the solvent to form a liquid;

applying the liquid to a plant leaf of the rootless cutting to induce root formation.

Claim 23. (Previously presented) The method of claim 17 further comprising:

placing the liquid in a sprayer capable of containing the solution.

Claim 24. (Currently amended) A method for promoting root formation on cuttings from plants comprising:

selecting a stem without roots having at least one leaf;

positioning the stem into a soil plug;



providing a solvent;

providing a root inducing compound, wherein the root  
inducing compound is capable of generating root formation  
in a rootless cutting,

mixing a root inducing compound with the solvent to  
form a liquid;

applying the liquid to a plant leaf of the rootless  
cutting to induce root formation.

**REMARKS/ARGUMENT**

**I. Status of the Claims**

Claims 5-11, 13, 15-18 and 20-24 are pending. Claims 5, 6, 9, 11, 15-18, 20 and 23 stand rejected. Claims 7, 8, 10, 13, 21, 22 and 24 are objected-to.

**II. Rejections Under 35 U.S.C. § 103(a)**

Claims 5, 6, 9, 11, 15-18, 20 and 23 stand rejected under 35 U.S.C. § 103(a) as being obvious in view of either Ahmed et al. or Katayama. Arguments in response thereto are included in an Appeal Brief filed concurrently herewith.

**III. Objected-to Claims**

Claims 7, 8, 10, 13, 21, 22 and 24 stand objected-to as being dependent from rejected base claims. Claims 7, 8, 10, 13, 21, 22 and 24 have been rewritten in independent form to render the objections thereto moot. Entry of the claims, and reconsideration and removal of the rejections of claims 7, 8, 10, 31, 21, 22 and 24 are respectfully requested.

**IV. After final Entry of Claim Amendments**

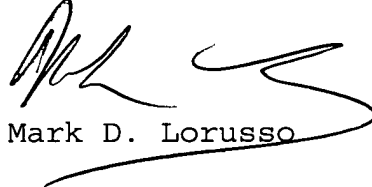
Applicants respectfully request entry of the amendments to the claims after final to advance the application to allowance. No new matter was added in this amendment and a new search should not be required.

**V. Conclusion**

Based on the foregoing, it is respectfully requested that all rejections be withdrawn and the application be passed to issue.

Respectfully submitted,

Lorusso & Associates



Mark D. Lorusso

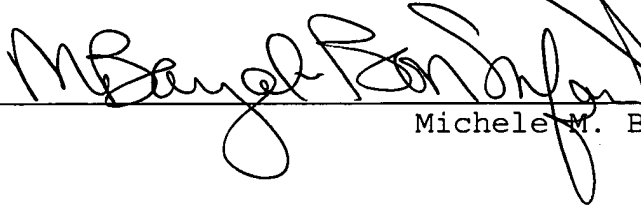
Reg. No. 41,955

Dated: 20 JAN 06

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The undersigned hereby certifies that this paper along with any paper or document referred to therein as being attached or enclosed, is being mailed with proper postage to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450- This 20<sup>th</sup> day of January 2006.

  
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Michele M. Bonenfant

# APPENDIX “C”



Appl. No. 09/931,193

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Conformation No. 1385

Appl. No. : 09/931,193  
Applicants : Masato Katayama  
Filed : 15 AUG 2001  
TC/A.U. : 1616  
Examiner : PRYOR, ALTON NATHANIEL  
Docket No. : HIR-139

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

DECLARATION UNDER RULE 1.132

I, MASATO KATAYAMA, do hereby declare and say that:

1. I am an inventor, joint owner and applicant of the above noted invention. The invention is owned jointly by The National Institute of Advanced Industrial Science and Technology, Tokyo, JAPAN; TOKAI KASEI CO. Ltd., Gifu, JAPAN; and Masato KATAYAMA, Aichi, JAPAN.

2. I have reviewed all the claims and understand the information contained therein. I have reviewed Ahmad et al (Physiologia Plantarum, 1987, 69(1), 137-40) and it does not teach or motivate one skilled in the art to apply 4-chloroindole-3-acetic acid to the surface of the leaf to promote the formation of new roots from a cutting as is required in independent claims 5, 16 and 17. The known method of root formation at the time of filing, to one skilled in the art, was the dipping of a cut stem in either a powder or solution containing root promoting formula and its placement into a growth medium such as potting soil. One skilled in the art would therefore not be motivated or taught by Ahmad et al to produce Applicants independent claims 5, 16 and 17.

3. I am intimately aware of the teachings of Katayama (Bioscience, Biotechnology, and Biochemistry Department, 2000, 64(4) 808-15) as I am one of the main authors of the paper. The paper was directed toward the study of root growth of seedlings and plant cuttings that were soaked and is silent regarding spraying. One skilled in the art would not be motivated to apply 4-CL-IAA to a leaf surface by spraying to initiate root growth of a cutting without reading the Applicants' patent specification.

4. The characteristic of this invention is to induce formation of roots on plant cuttings by spraying the agent onto only the leaves of the rootless plant cuttings, utilizing the characteristic of transition of the composition, which is described in formula 1, within the plants, thus the agent can reach the incision. To the best of my knowledge, one skilled in the art would not be motivated to apply any known root formation compounds to a leaf surface of a cutting to induce root growth. To the extent of my knowledge, spraying of plants with beneficial compounds, such as fertilizers, were sprayed only on plants having existing root structures, such as lawns, to expedite the transport of the beneficial compounds to the roots and not onto rootless cuttings as claimed in the instant application. One skilled in the art was unaware that spraying was an effective means of promoting root growth in cuttings and therefore the teaching is found only in the Applicants' specification.

5. In addition, when spraying is compared to soaking, providing the plants with the roots-inducing agent without soaking the plants in the solution shows an



advanced effect. In the case of soaking the plants in the solution, if any viruses exist in plant cuttings without roots, other plants can be infected with the viruses, and the viruses may prevail in all of the plants. On the other hand, the method of providing the plants with the roots-inducing agent of plants by spraying the agent onto the only leaves of the plants after cutting and being placed into cultivation does not cause such a problem. Furthermore, the invention allows for reapplication of the root inducing formulation at timed intervals not possible with the application of the formulation to the stem.

6. The horticultural industry produces a large portion of plants grown for sale to consumer or other businesses by asexual means, specifically propagation from a parent by a rootless cutting. The industry has had a long felt need for the Applicants invention that was not addressed previously in the industry. As such, we believe that the system and method of the current invention has a high value in the industry, and is non-obvious as this was not a known method for root formation in a cutting.

7. All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 8 of the United States Code, and that such willful false statement may jeopardize validity of the application or any patents issuing thereon.

Signed:

  
Masato KATAYAMA

Sept 13, 2005  
Date: